

USER'S MANUAL

**High-powered and programmable
Switching Power supply
Model IT6532A/IT6533A/IT6523D**



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About your safety

Please review the following safety precautions before operating our equipment.

General information

The following safety precautions should be observed before using this product and any associated instrumentations. Although some instruments and accessories would be used with non-hazardous voltages, there are situations where hazardous conditions may be present.

This product is intended for use by qualified personnel who recognize shock hazards and are familiar with the safety precautions required to avoid possible injury. Read and follow all installation, operation, and maintenance information carefully before using the product. Refer to this manual for complete product specifications.

If the product is used in a manner not specified, the protection provided by the product may be impaired. Before performing any maintenance, disconnect the line cord and all test cables.

Protection from electric shock

Operators of this instrument must be protected from electric shock at all times. The responsible body must ensure that operators are prevented access and/or insulated from every connection point. In some cases, connections must be exposed to potential human contact. Product operators in these circumstances must be trained to protect themselves from the risk of electric shock. If the circuit is capable of operating at or above 1000 volts, no conductive part of the circuit may be exposed.

Definition of user

Responsible body is the individual or group responsible for the use and maintenance of equipment is operated within its specifications and operating limits, and for ensuring that operators are adequately trained.

Operators use the product for its intended function. They must be trained in electrical safety procedures and proper use of the instrument. They must be protected from electric shock and contact with hazardous live circuits.

Service is only to be performed by qualified service personnel.

Safety symbols and terms



Connect it to safety earth ground using the wire recommended in the user manual.



The symbol on an instrument indicates that the user should refer to the operating instructions located in the manual.



High voltage danger

Certification and Warranty

Certification

We certify that this product meet its published specifications at time of shipment from the factory.

Warranty

This instrument product is warranted against defects in material and workmanship for a period of one year from date of delivery. During the warranty period we will, at its option, either repair or replace products which prove to be defective. For warranty service, with the exception of warranty options, this product must be returned to a service facility designated by us. Customer shall prepay shipping charges by (and shall pay all duty and taxes) for products returned to the supplier for warranty service. Except for products returned to customer from another country, supplier shall pay for return of products to customer.

Limitation of Warranty

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by the Customer, Customer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper site preparation and maintenance.

Introduction

IT6500A series is a flexiable range single output high power supply. With wide power ranges from 3KW to 6KW, currents from 120A to 240A. Standard RS232, USB, GPIB, RS485 and LAN interfaces included on the rear panel provide flexibility for remote operation of the power supply. Its compact 4U(6KW) size form factor makes it ideal for use in a standard 19-inch rack.

- (1) Auto-Range function
- (2) High Resolution Display
- (3) RS232/USBTMC/GPIB/RS485/LAN standard interfaces
- (4) Sequence programming (List mode)
- (5) OVP and OPP protection
- (6) Remote sense function
- (7) Intelligent fans control

Model	Voltage	Current	Power
IT6523D	160V	120A	3000W
IT6532A	80V	240A	6000W
IT6533A	160V	120A	6000W

Chapter1 Inspection and Installation

Power supply is an equipment with high grade of security. It has a protective earth terminal. Please note the security label and instructions in the manual.

1.1 Inspection

The following steps help you verify that the power supply is ready for use.

1.check the appearance

If you find any damage of the panel or outline border, please contact with the local franchisers of ITECH or the service department. Before you get a positive answer, please do not return the unit.

2.check the accessories

To verify that you have received the following items along with your power supply. If something is missing, please contact with the nearest franchisers.

- ☐ one USB cable
- ☐ one user's manual.
- ☐ AC input line
- ☐ one calibration report

3.AC input

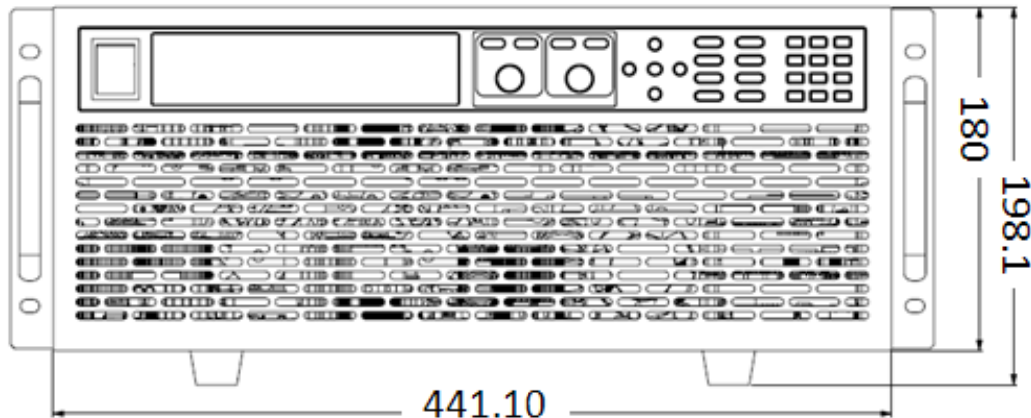
220VAC $\pm$ 10%, 47 to 63 Hz

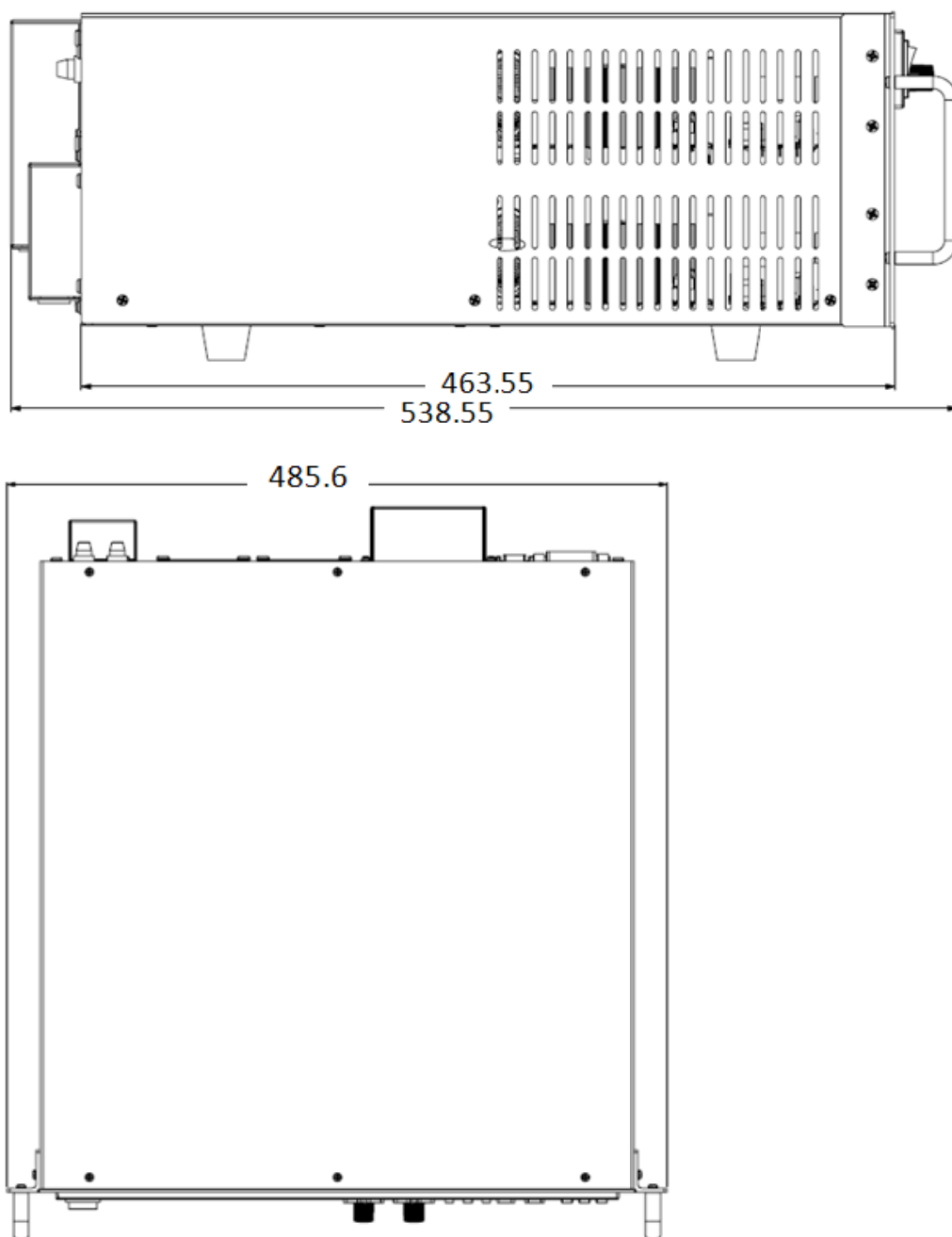
1.2 Dimension

The dimension of IT6532A/IT6533A/IT6523D

441.1mmW $\times$ 180mmH $\times$ 463.55mmD

Refer to the following dimension drawing:





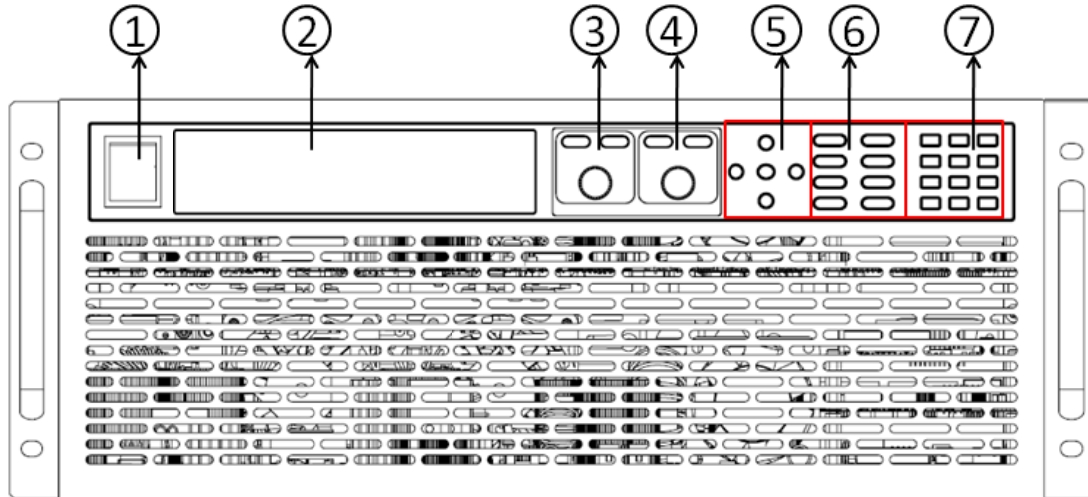
unit: millimeter (mm)

IT6532A/IT6533A/IT6523D dimension drawing

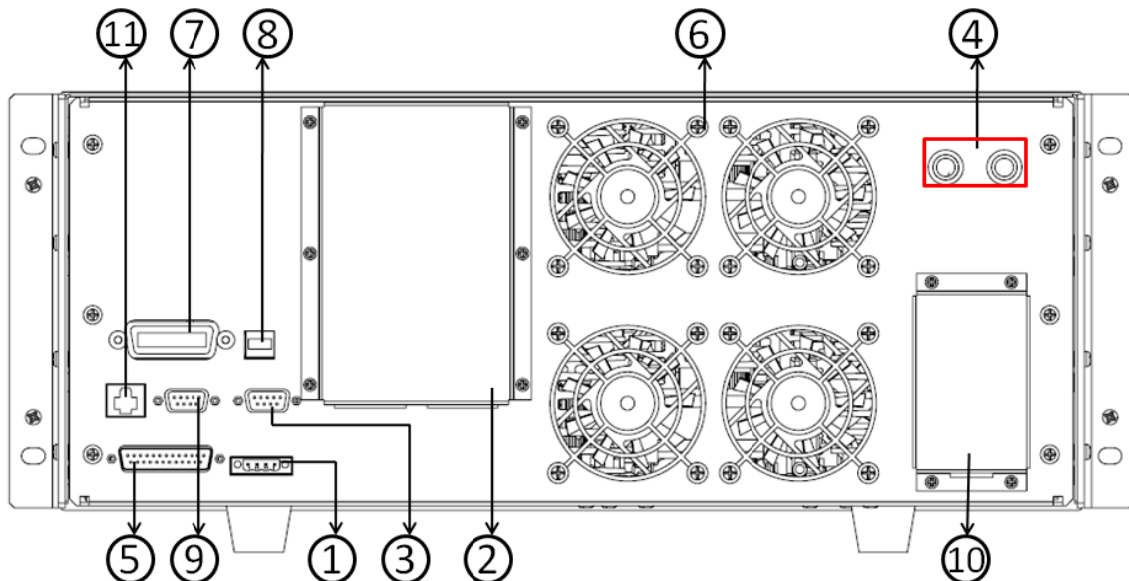
Chapter2 Quick start

This chapter will introduce the front panel, rear panel, keyboard function and VFD display function. To ensure you have a quick understanding of this product before you using it.

2.2 Description of front panel and rear panel

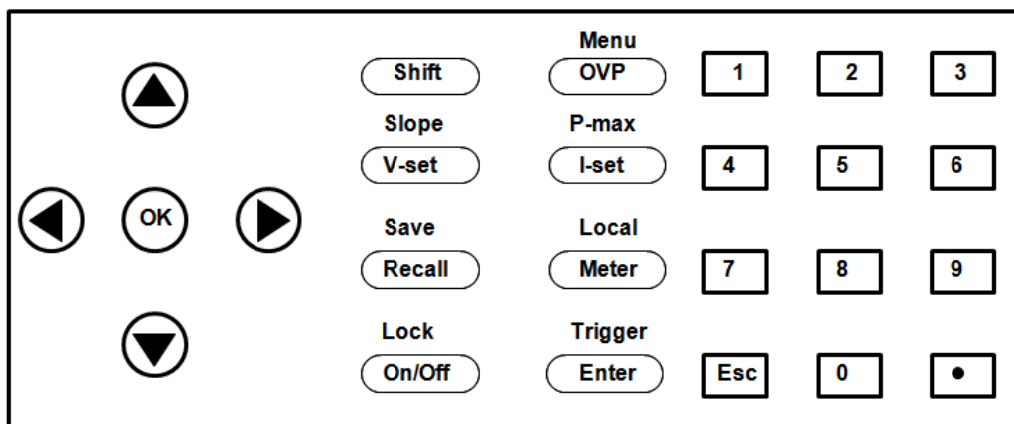


1. power supply switch
2. VFD display board
3. pulsating knob to control voltage, coarse button, fine button
4. pulsating knob to control current, coarse button, fine button
5. direction key and  key
6. function keys and composite key
7. numeric key,  key



1. remote sense and output terminals
2. output terminal
3. RS485 communication interface (for factory use only)
4. fuse
5. DB25 interface
6. fans
7. GPIB communication interface
8. USB communication interface
9. RS232 communication interface
10. AC power input socket
11. Ether communication interface

2.2 keyboard introduction



Keyboard instructions as follows:

keys	Name and function
0-9	Numeric button
	Composite function button
 Menu	OVP setting button,the button used to set the ovp value/menu function button which used to set the related parameters of power supply
 Slope	Voltage setting button,used to set the output voltage value/set the rising time and fall time of voltage
 Pmax	Current setting button,used to set the output current value/set the maximum power value
 Save	Callback button,used to recall a saved setting parameter/save button,used to save a setting parameter
 Local	Meter button,used to switch the display between actual value and setting value /switch to the local mode
 Trigger	Confirm button,to confirm the setting numbers or function/trigger button,used to provide a trigger single for voltage/current output(for SCPI command)
 Lock	Output on/off button,used to control the output status of power supply/keylock function button,used to lock the front panel buttons
	Left and right direction button,used to adjust the location of the cursor
	Up and down direction button,used to select the items of the menu or increase(decrease) the output voltage and current value

	Confirm button
	Quit button

2.3 VFD indicator lamps description

As follows:

Chart	Function description	Chart	Function description
OFF	Power supply in off mode	Timer	none
CV	Power supply in CV mode	Sense	none
CC	Power supply in CC mode	Ext	none
*	Open the keylock function	Adrs	Display 3 seconds once data reach communication interface
Meter	"Meter" button in on mode	Rmt	Remote control mode
Shift	using composite function	Error	Error occur
Rear	Open analogue function	Prot	Protections for OVP OTP
SRQ	Source inner request events	Trig	Trigger mode

Chapter3 power-on inspection

This chapter will introduce the power-on check procedure to ensure the unit is ready for use. It includes two parts: pre-check and output check.

3.1 power on pre-examination

Power on pre-examination includes two parts: initial power supply and system selftest.

1. Initial power source

Use the following steps to help solve problems you might encounter when turning on the instrument. If the unit can not be started normally, please check according to the following guidance.

1) Verify that there is AC power to the power supply

First, verify that the power cord is firmly plugged into the power receptacle on the rear panel of the power supply. You should also make sure that the power source you plugged the power supply into is energized. Then, verify that the power supply is turned on

2) Verify that the correct power-line fuse is installed.

If the fuse was damaged, please see the table below to replace the fuse for your power supply

model	Fuse specification (220VAC)	
IT6532A	20A	250V
IT6533A	20A	250V
IT6523D	20A	250V

3) The way to change the fuse

Open the plastic lid in the below of the power input socket, you will see the fuse, and then exchange a good fuse according to the above specification.

2. System selftest

When you turn on the power supply, it will do the system selftest.

If the EEPROM was damaged, the VFD will display as follows:

EEPROM FAILURE

If the latest operation data in EEPROM is lost, the VFD will display as follows:

Config Data Lost

If the calibration data in EEPROM is lost, the VFD will display as follows:

Calibration Data Lost

If the factory calibration data in EEPROM is lost, the VFD will display as follows:

FactoryCal.Data Lost

If the system setting data in EEPROM is lost, the VFD will display as follows:

MainframeInitializeLost

If all is normal, the VFD will display the voltage and current as the following status:

OFF
0.000V 0.000A
0.0W

3.2 Output checkout

The following procedures check to ensure that the power supply develops its rated outputs and properly responds to operation from the front panel.

1 Voltage Output Checkout

The following steps verify basic voltage function without load.

- 1) Turn on the power supply
- 2) Set the output current ($\geq 0.1A$)
- 3) Open the output
Press on/off button, the CV indicator lamp will be lit.
- 4) Open the Meter button
- 5) Set the output voltage
Set different voltage and check whether the VFD display voltage is approximate to the setting voltage.
- 6) Ensure the output voltage can be adjusted from 0V to full rated value

2. Output current checkout

The following steps check basic current function with a short across the power supply's output

- 1) Turn on the power supply.
- 2) Disable the output
Press **On/Off** key to ensure that the output is disabled.
- 3) Connect a short across (+) and (-) output terminals with an insulated test lead.
Use a wire size sufficient to handle the maximum current.
- 4) Enable the output and open the Meter function button
To ensure the CC indicator lamp is lit
- 5) Adjust the current
Set different current values and check whether the voltage display is approximate to 0V, the display current value is approximate to the setting value
- 6) Ensure that the current can be adjusted from zero to the full rated value.
- 7) Turn off the power supply and remove the short wire from the output terminals.

Chapter4 Specification

This chapter will introduce the rated voltage,current, power and many other main parameters of IT6500A.

4.1 Main technical parameters

parameters		IT6532A
Rated value (0 °C - 40 °C)	voltage	0~80V
	current	0~240A
	power	0~6000W
(in remote sense mode) Load regulation $\pm$ (% of output+offset)	voltage	<0.05%+40mV
	current	$\leq$ 0.1%+60mA
Line regulation $\pm$ (% of output+offset)	voltage	<0.02%+20mV
	current	<0.02%+30mA
Setting resolution	voltage	2mV
	current	6mA
Readback resolution	voltage	2mV
	current	6mA
Setting accuracy (within twelve months) (25°C $\pm$ 5°C) $\pm$ (% of output+offset)	voltage	$\leq$ 0.05%+40mV
	current	$\leq$ 0.2%+0.1%FS
Readback accuracy (25°C $\pm$ 5°C) $\pm$ (% of output+offset)	voltage	0.05%+40mV
	current	$\leq$ 0.2%+0.1%FS
Ripple (20Hz ~20MHz)	voltage	$\leq$ 100mVp-p
	current	240mArms
Tem coefficient (0 °C ~ 40 °C) $\pm$ (% of output+offset)	voltage	0.02%+40mV
	current	$\leq$ 0.05%+20mA
Readback Tem coefficient $\pm$ (% of output+offset)	voltage	0.02%+40mV
	current	$\leq$ 0.05%+20mA
dimension (mm)	439mmW $\times$ 180mmH $\times$ 534mmD	
weight (Kg)	34Kg	

parameters		IT6533A
Rated value (0 °C - 40 °C)	voltage	0~160V
	current	0~120A
	power	0~6000W
(in remote sense mode) Load regulation $\pm$ (% of output+offset)	voltage	<0.05%+40mV
	current	$\leq$ 0.1%+40mA
Line regulation $\pm$ (% of output+offset)	voltage	<0.02%+20mV
	current	<0.02%+20mA
Setting resolution	voltage	4mV
	current	3mA
Readback resolution	voltage	4mV
	current	3mA
Setting accuracy (within twelve months) (25°C $\pm$ 5°C) $\pm$ (% of output+offset)	voltage	$\leq$ 0.05%+40mV
	current	$\leq$ 0.2%+0.1%FS
Readback accuracy (25°C $\pm$ 5°C) $\pm$ (% of output+offset)	voltage	0.05%+40mV
	current	$\leq$ 0.2%+0.1%FS
Ripple (20Hz ~20MHz)	voltage	$\leq$ 150mVp-p
	current	120mArms
Tem coefficient (0 °C ~ 40 °C) $\pm$ (% of output+offset)	voltage	0.02%+40mV
	current	$\leq$ 0.05%+20mA
Readback Tem coefficient $\pm$ (% of output+offset)	voltage	0.02%+40mV
	current	$\leq$ 0.05%+20mA
dimension (mm)	439mmW×180mmH×534mmD	
weight (Kg)	34Kg	

parameters		IT6523D
Rated value (0 °C - 40 °C)	voltage	0~160V
	current	0~120A
	power	0~3000W
(in remote sense mode) Load regulation $\pm$ (% of output+offset)	voltage	<0.05%+40mV
	current	$\leq$ 0.1%+40mA
Line regulation $\pm$ (% of output+offset)	voltage	<0.02%+20mV
	current	<0.02%+20mA
Setting resolution	voltage	4mV
	current	3mA
Readback resolution	voltage	4mV
	current	3mA
Setting accuracy (within twelve months) (25°C $\pm$ 5°C) $\pm$ (% of output+offset)	voltage	$\leq$ 0.05%+40mV
	current	$\leq$ 0.2%+0.1%FS
Readback accuracy (25°C $\pm$ 5°C) $\pm$ (% of output+offset)	voltage	0.05%+40mV
	current	$\leq$ 0.2%+0.1%FS
Ripple (20Hz ~20MHz)	voltage	$\leq$ 150mVp-p
	current	120mArms
Tem coefficient (0 °C ~ 40 °C) $\pm$ (% of output+offset)	voltage	0.02%+40mV
	current	$\leq$ 0.05%+20mA
Readback Tem coefficient $\pm$ (% of output+offset)	voltage	0.02%+40mV
	current	$\leq$ 0.05%+20mA
dimension (mm)	439mmW×180mmH×534mmD	
weight (Kg)	34Kg	

4.2 Supplemental characteristics

State storage capacity

100 sets

Recommended calibration frequency

once a year

Cooling style

fans

Operation Temperature

0 to 40 °C

Storage Temperature

-20 to 70 °C.

Environmental Conditions

Designed for indoor use and operated at maximum relative humidity of 80%

Chapter5 Basic Operations

This chapter describes in detail the use of the front-panel keys and shows how they are used to accomplish power supply operation.

This chapter is divided into the following sections:

- Local mode / Remote mode
- Setting voltage
- Setting current
- On/off
- Actual value display/setting value display
- Adjustment of current/voltage/power
- Save operation

5.1 Local/Remote

You can switch from remote mode to local mode by press **Shift** + **Meter** buttons.

When you turn on the unit, it will default in local mode and all buttons are available. That's to say, in remote mode, the front panel buttons can't be used. The two operating modes can be switched through PC. When the operating mode is changed, all the output parameters will not be effected.

5.2 Setting voltage

The constant voltage range is from 0V to the maximum voltage value. It is very easy for you to set the constant voltage output. You have 3 solutions to set the constant voltage value. And when you press **V-set**, this button will be lit.

(1) directly input through number keys

Input the value you want to set and then please press **Enter** or **OK** button to confirm.

(2) using knob to set value

Press **V-set** button

Press **Crss** button (coarse adjustment, change the value in integer bit) or **Fine** button (fine adjustment, change the value in decimal bit), and then rotate the knob to set the value

(3) using left and right direction key to set value

Press **V-set** button

Press **Crss** button (coarse adjustment, change the value in integer bit) or **Fine** button (fine adjustment, change the value in decimal bit), and then through left and right keys to adjust the cursor

location, press **▲** and **▼** to set the voltage value

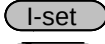
5.3 Setting current

The constant current range is from 0A to the maximum voltage value. It is very easy for you to set the constant current output. You have 3 solutions to set the constant current value. And when you press **I-set**, this button will be lit.

(1)directly input through number keys

Input the value you want to set and then please press  or  button to confirm.

(2)using knob to set value

Press  button

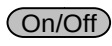
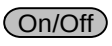
Press  button(coarse adjustment,change the value in integer bit) or  button(fine adjustment,change the value in decimal bit),and then rotate the knob to set the value

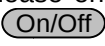
(3)using left and right direction key to set value

Press  button

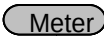
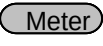
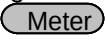
Press  button(coarse adjustment,change the value in integer bit) or  button(fine adjustment,change the value in decimal bit),and then through left and right keys to adjust the cursor location,press  and  to set the current value

5.4 On/off button

 button is used to control the output state of power supply. If  button is lit,this represents output is on.And in on mode,the indicator lamp(CC/CV) will be lit.

Note:please ensure that the DC source and product under test have been connected well before you press  button.

5.5 Setting value/Actual value

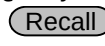
 button is used to switch the display between actual value and setting value.When  button is lit,this represents that VFD board display is actual value.Reversely,if  button is dark,VFD board display is corresponding to setting value.

5.6 Voltage and current adjustment

Power supply's output voltage and Electronic load's resistance determine the output current.Only when the actual current value is lower than the setting current value,can the power supply works in CV mode.And the CV indicator lamp will be lit.

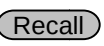
If the actual current value is limited by the setting current value or rated current,then IT6500A will change to CC mode.And the CC indicator lamp will be lit.

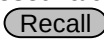
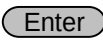
5.7 Save operation

IT6500A can enable you to save some often used parameters in nonvolatile memory up to 100 sets.So that you can recall the parameters quickly.The following ways can help you achieve the save and recall operations:by pressing composite button  +  (Save) button or through command *SAV,*RCL.Save operation should work in with GROUP.Each GROUP can save 10sets,IT6500A includes 10 GROUP from 0-9.

Save parameters include setting voltage and setting current

Save method:

Using composite button  +  +number keys 1...9,and then pressing  button to save the preset value into specified memory region.

Using  button +number keys 1-9,and then pressing  button to recall the saved parameters from specified memory region.

5.8 Trigger operation

Please select the trigger mode in the menu setup before you start a trigger operation.

Before you want to run a list sequence file, please provide a trigger signal by press composited button

Shift + **Enter** (trigger). During the list file running, the button **Enter** (trigger) will be alight.

5.9 Menu Operation

1. Menu description

Press **Shift** + **OVP** (Menu) to enter the menu function. View the menu in VFD, and use right and left direction key or knob to scroll through the complete menu list as following. If press **Enter** button, you could get the selected menu function. Press **Esc** back to the previous menu selection page.

SYSTEM	MENU	System menu	
	Initialize	Init Setup	Initialize the system
		No	Do not initialize the system
		Yes	Initialize the system
	Power -On	P-OUT	Set power on parameters
		Rst(Def)	Restore to factory defaults
		Sav0	Remain last shutdown parameters
	Trigger	TRIGGER SOURCE	Set trigger mode
		Manual(Def)	Manual trigger
		Bus	BUS trigger
	Memory	MEMORY	Work with recall button to recall 100sets saved parameters
		Group = 0	0:represents 1-10sets; 1:represents:11-20sets, by parity of reasoning
	Buzzer	BUZZER STATE	Set status of buzzer
		On(Def)	enable the buzzer function
		Off	disable the buzzer function
	Communication	COMMUNICATION	Select communication interface
		RS232(Def) according to your test demands and combine with direction keys to select RS232 configure	Select RS232 interface
			4800, 8, N (None parity), 1, Addr...
			9600, O (odd parity), 2, (0~31)
			19200, E (even parity)
			38400
			57600
			115200
		USB	Select USB interface
		GPIB	Select GPIB interface
			Addr=0 set the communication address
		ETHERNET	Select Ethernet interface

			Gateway= 192.168.0.1	
			IP= 192.168.0.125	
			Mask= 255.255.255.0	
			Socket Port= 30000	
	ReturnMeter	RETURN METER	Return to meter interface	
		Off(Def)	Do not use automatic return	
		Delay	Return after 5 seconds	
	P-Out	P-On Output	Power on output status set	
		Off(Def)	The status is OFF when power on	
		Last	The status will keep the same as the last set before power off	
CONFIG	CONFIG MENU			
	Volt-Max	Vmax=161.00V	Set max value of voltage	
	Volt-Min	Vmin= 0.00V	Set min value of voltage	
LIST	LIST MENU			
	Off		Exit LIST mode	
	Recall	RECALL LIST	Recall list files	
		Recall List File= 1	Select recalled list file (0-9)	
	EditList		Edit LISTfiles	
	Edit Seq		Edit sequence	
INFO	Power Info...		Information of this machine	
	Model:IT65xxx Ver:0.02-0.02 0123456789AF		Model, software version, series number	
	No Information		Reserved for calibration information	

Note:press **Shift** + **OVP** (Menu) to view the menu items,press **Esc** to quit menu operation.Besides,press **Esc** button can enable you quit the function operation state.

2.Menu function

Initialize setting (> Initialize)

This item can enable all setup of the menu to factory default.Press **Enter** to confirm.

Trigger Mode (>Trigger)

This item is used to set the trigger source,to be Manual trigger mode or Bus trigger mode.It often be used to provide a trigger signal for a list operation.In Manual option,press **Shift** + **Enter** (Trigger) could generate a trigger signal.If in BUS option,this indicates in BUS trigger mode.

Factory default is Manual option.

Save Group Operation (Memory)

Power source can save 100sets parameters in nonvolatile memory by the save group setting.This operation provides the customer with a convenient and quick save/recall using condition.

GRP0:save(recall) power source parameters in 0-9 sets.Press **Shift** + **Recall** (Save)+0-9 numeric keys(**Recall** +0-9 numeric keys to recall the parameters)

GRP1:save(recall) parameters in 10th -19th sets.Press **Shift** + **Recall** (save)+numbers1-9 to save the parameters(**Recall** +numbers1-9 to recall parameters).Under this condition,number “1” represents to save or recall the 10th parameters.Number “2” represents to save or recall the eleventh parameter.GRP2-GRP9 can be understood in the same manner.

Key Sound Set(>Buzzer)

This item can set the buzzer state.**On** option indicates that when you push buttons,the buzzer will sound.**OFF** option indicates that the buzzer function is disabled.Factory default is **On** option.

Output voltage set (>Vmax,Vmin)

The voltage can be set between 0A and rated voltage.Pressing **Shift** + **OVP** (Menu) to entry into Config item,and then using knob or direction keys to select Vmin option under Limit item.Press **Enter** button,then set the minimum voltage.After pressing **Enter** button,you could set the maximum voltage.After the setting operation,the voltage can only be adjusted within the limitation of Vmin and Vmax.

Default Vmax value is the rated voltage,and Vmin is 0V.

Communication Set(>Communication)

Under this item,you can set the concrete communication mode.This unit has provided multiple communication interfaces:RS232/USB/GPIB/ETHERNET.Of which,the GPIB are addressable from 0-31.The baudrate options of RS232 are 4800,9600,19200,38400,57600,115.2K.Data bit is 8bits.Parity bit has three options:NONE,ODD,EVEN.Please ensure the configuration consistency between our instrument and PC,so that you could have a successful communication.

List Operation(>List)

Please preset the trigger mode before you run a list file.

Press **Shift** **Shift** +(Menu) to enter the menu setup.Then press up and down buttons to select item **>System**,press **Enter** to confirm.After that,press up and down buttons to select **>Trigger** item to set the trigger mode,and press enter to confirm.

Operation steps

1. Press **Shift** + **QVP** (Menu) to enter the menu setup
2. VFD display **SYSTEM**,press **▽** to select **LIST**,press **Enter** to confirm
3. VFD display **OFF**,press **▽** to select **EDITLIST** item,press **Enter** to confirm
4. VFD display **File Name xx---**,input the sequence file name(1---10) to be edited
5. VFD display **List Power =xxxxxW----**,input the maximum power value
6. VFD display **List Repeat =xxxxx----**,input the repeat running times(1---65535) of LIST file
7. VFD display **Active Seq:0987654321 ----**---select the sequence name to be linked in one LIST file.After you select the sequence number,then according number will change to "Y"
8. VFD display **Seq n Repeat:xxxxx----**,set the repeat running times of the linked sequence n(1---65535)
9. Save list to File?----,press **Enter** or **OK** to finish the edit operation

Sequence Operation(>Seq)

Please preset the trigger mode before you edit a sequence file

Press **Shift** + **QVP** (Menu) to enter the menu setup.Then press up and down buttons to select item **>System**,press **Enter** to confirm.After that,press up and down buttons to select **>Trigger** item to set the trigger mode,and press enter to confirm.

You could edit various kinds of sequence with variable output by setting up every step's parameters.The parameters includes step-voltage,step-current,step-time and time unit.Besides the former parameters,you should also edit whether continue to the next step,repeat times and whether to save the file.After you finish the sequence file edition,if the instrument receives a trigger signal,the sequence file will begin to run until finishing the sequence, or receive another trigger signal.The following will take a three sequence file to be an example:

Operation Steps:

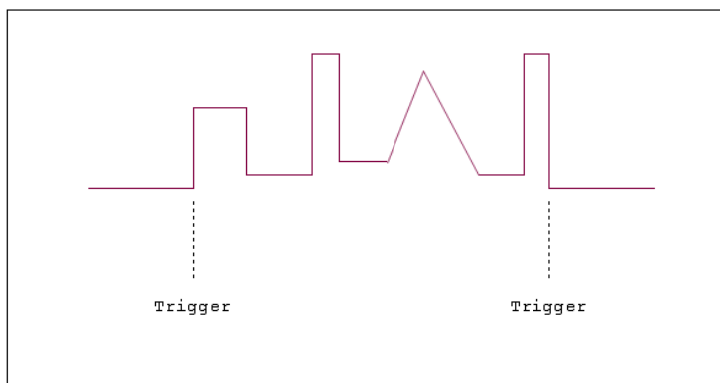
1. Press **Shift** + **QVP** (Menu) to enter the menu setup
2. VFD display **SYSTEM**,press **▽** to select **LIST**,press **Enter** to confirm
3. VFD display **OFF**,press **▽** to select **EDITSeq**,press **Enter** to confirm.
4. VFD display **Seq Name: xx**,input the sequence name to be edited (1-10)
5. VFD display **Active Step:0987654321**, activate the sequence steps,when step is activated, according number will change to "Y"(for example:select step 1)
6. VFD display **Seq Step n Voltage =xxxxxV**,set the voltage of activated sequence step(for example:3V)
7. VFD display **Seq Seq n Current =xxxxxA**,set the current of activated sequence step(for

example:1A)

8. VFD display **Seq Step n Width =xxxxxms**,set the duration of time of the activated step(1---65535),(for example:3000ms)
9. VFD display **Seq Step n Slope=xxxxxms**.Set the voltage rising time of the activated step(0-65535),for example:30ms
10. VFD display **Active Step:0987654321**,input step number,for example:2
11. VFD display **Seq Step n Voltage=xxxxxV**,set the voltage of activated sequence step(for example:5V)
12. VFD display **Seq Step n Current=xxxxxA**, set the current of activated sequence step n(for example:4A)
13. VFD display **Seq Step n Width=xxxxxms**.for example 3000ms
14. VFD display **Seq Step n Slope=xxxxxms**,for example 30ms
15. VFD display **Active Step:0987654321**,for example 3
16. VFD display **Seq Step n Voltage=xxxxxV**,for example 7V
17. VFD display **Seq Step n Current=xxxxxA**,for example 8A
18. VFD display **Seq Step n Width=xxxxxms**,for example 3000ms
19. VFD display **Seq Step n Slope=xxxxxms**,for example 30ms
20. VFD display **Save Seq To File?----**Press **Enter** or **OK** button to finish the edition

Trigger the sequence file:

1. Press **Shift** + **QYP** (Menu) to enter the menu setup
2. VFD display **SYSTEM**,press **▽** to select **LIST**,press **Enter** to confirm
3. VFD display **OFF**,press **▽** to select **CALLSeq**,press **Enter** to confirm
4. Press **Shift** + **Enter** (Trigger) button to give a trigger signal



5.10 Protection Function

IT6500A has provided with OVP,OCP,OPP,OTP function.

You could set the over voltage protection value by press **OVP** button.Many reasons could cause a over voltage error.For example, caused by internal defect,misoperation,or too high external voltage.Once the power supply is over voltage protected,will the output be shut down at once,and "OVP" indicator lamp will be lit.

One superior function of IT6500A is that it can enable you to set the protection delay time(**Tovpdiy**) within the range of 1~600ms.

Please avoid inputing a external voltage higher than 120% rated value of IT6500A,or the instrument will be damaged.

When the power source is in OVP state,you should check the external cause first.When the external factors are excluded,please press ON/OFF button.Then the unit could have a output voltage again.If in remote control mode,you should clear the OVP state,then could you open the output by OUP ON command.

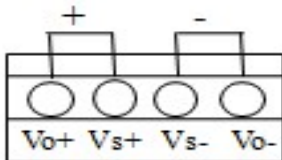
About OPP:IT6500A will be over power protected if the actual power is higher than Pmax which we set in the menu.when OPP is activated, the output will turn off and "OPP" will appear on the VFD.

OTP point: 75℃

5.11 Key Lock Function

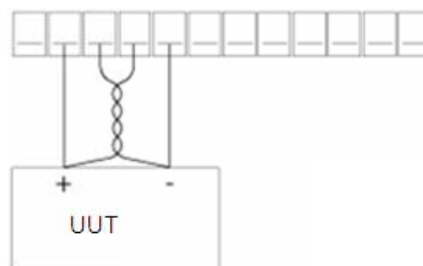
Shift + (Lock) button can enable you to lock the front panel buttons,then VFD will display "*".In keylock mode,all buttons will not work except ON/OFF,Meter and **Shift** buttons.Re-press **Shift** + **On/Off** (Lock) button will release the keylock function.

5.12 Rear terminal function



Vo+,Vo- : output terminals,the same with the rear panel output terminals

Vs+,Vs- : remote sense terminal,when using the remote sense function,please cut off the connection between **Vo+ and Vs+**,so will the line between **Vo- and Vs-** terminals.Then extending lines from Vs+ to the positive terminal of undertested product and line from Vs- to the negative terminal of the product under test.



Chapter6 Remote Control

6.1 Communication interfaces

IT6500A has five standard communication interfaces:RS232,USB,GPIB,Ethernet. The customer can choose any one according to his demands.

6.1.1 RS232 interface

Using a cable with two COM ports to connect power supply and PC.Then please press **Shift** + **QYP** (Menu) button to enter the menu to configure the communication parameters.You could do the secondary development with all SCPI commands.

Note: The setup about RS232 in the program should agree with the configuration in the system set.If you want to change the communication parameters,please press **Shift** + **QYP** (Menu) button to enter the system set.

RS232 Data style

RS232 is a 10-bit data with start bit and stop bit.The start bit and stop bit can not be edit.While you could select the odd parity or even parity under the system set. Odd or EVEN options have been saved in the nonvolatile memory.

Baudrate

Edit baudrate:press **Shift** + **QYP** (Menu) to enter the menu setup,you could select the baudrate among the following options:
4800 9600 19200 38400 57600 115200

RS232 connection

Please use a straight-through RS232 cable with DB-9 interface and connect the RS232 serial port with the controller's serial port(for example.PC). Form 2-2 give a detailed description for each pin.



RS232 pins description

Pin	description		
1	connectionless	6	connectionless
2	TXD,transmit data	7	connectionless
3	RXD,receive data	8	connectionless
4	connectionless	9	connectionless
5	GND		

RS232 Troubleshooting:

If you meet some problems when communicating with PC by RS232 interface, please check the following items:

Please check the parameters setting

PC and power supply must have the same configuration in the following items: baudrate, parity bit, data bit and flow control. Please note that power supply has been configured with a start bit and stop bit (the two values are fixed).

Check the cable

Ensure you have used the correct communication cable. Please pay attention that some cable may not have a correct internal wiring even if it is with an appropriate DB9 interface.

The RS232 communication cable should have been connected to a correct serial port of the PC.

Communication Setup

Please ensure the PC and power supply have the same configuration in the following items.

baudrate: 9600(4800, 9600, 19200, 38400, 57600, 115200). You could enter the system menu to set the baudrate.

Data bit: 8

Stop bit: 1

Parity bit: (none, even, odd)

EVEN 8 data bits have even parity

ODD 8 data bits have odd parity

NONE 8 data bits have no parity

Native machine address: (0 ~ 31, factory default is 0)

Parity=None	Start Bit	8 Data Bits	Stop Bit
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6.1.2 USB interface

Use a cable with two USB ports to connect power supply and PC. You can program through USB interface to achieve all functions of power supply.

The functions of USB488 interface are as follows:

- ◆ Interface is 488.2 USB488 interface
- ◆ Receive the following request: REN_CONTROL, GO_TO_LOCAL, and LOCAL_LOCKOUT
- ◆ When the interface receives MsgID = TRIGGER USBTMC command, it will transmit the TRIGGER command to the function layer

The functions of power supply's USB488 are as follows:

- ◆ receive all SCPI commands
- ◆ device is SR1 enabled
- ◆ device is RL1 enabled
- ◆ device is DT1 enabled

6.1.3 GPIB Interface

Use an IEEE488 bus to connect GPIB interfaces of power supply and PC. Please ensure that the

screws have been screwed down in order to have a full connection. Then press **Shift** + **QYP** (Menu) to enter the system menu to set the address. The address range of power supply is 0-31. After you set the address, please press **Enter** button to confirm. GPIB address is saved in nonvolatile memory.

6.1.4 Ethernet interface

Use a straight-through cable connects Ethernet port and PC.

Press  +  (Menu) button to enter the system set. Select Ethernet under communication and set Gateway, IP, Mask and Socket port.

6.2 Standard software and SCPI command

We free provide IT7000software and SCPI command which support secondary development. Please downloadthe software or SCPI from our website,www.itechate.com or contact us directly.

Support process

If you have a problem , follow these steps:

- 1 Check the documentation that come with the product
- 2 Visit the ITECH online service Web site is www.itechate.com ,ITECH is available to all ITECH customers. It is the fastest source for up-to-date product information and expert assistance and includes the following features :
 - Fast access to email AE
 - Software and driver updates for the product

Call ITECH support line 025-52415098

